

REMARKS

Claims 19, 20, 24 – 26 and 31 remain in the application. All other heretofore existing Claims have been canceled. New Claims 36 - 42 have been added. Claim 19 is the sole remaining independent Claim in the application, all others of the remaining claims being dependent, either directly or indirectly on Claim 19.

Claims 1-18. (Cancelled)

Claim 19, as amended by the present response, reads as follows:

19. A laminate for producing a paper package comprising:

a paper substrate; and

interior to said substrate, a blend barrier layer made from ethylene vinyl alcohol copolymer and a polyolefin selected from the group consisting of low-density polyethylene, polypropylene and linear low-density polyethylene in the absence of a compatibilizer,

wherein the EVOH in said blend barrier layer comprises not less than 35% and not greater than 95%, by weight, ethylene vinyl alcohol copolymer having an ethylene content of between 29 and 50 mole%,

and wherein said blend layer exhibits a multiple phase morphology comprising a EVOH phase and a phase comprising said polyolefin selected from said group, said EVOH phase being a predominately continuous phase.

Claims 19-23 and 26-35 stand rejected under 35 USC §103(a) over Huffman et al (US Pat. No. 5,114,626) in view of Pearson et al. (WO/10053).

Huffman is acknowledged as NOT disclosing "the exact composition of the EVOH nor that the barrier layer is a blend of EVOH and an olefin polymer" as claimed by Applicant. Analysis of this acknowledgement immediately brings into question the validity of Huffman as a primary reference in a 35 USC §103(a) based rejection of Claim 19. This is for the reason that Applicant's Claim 19, as amended, is clearly based upon the premises of

- (1) a blend layer,
- (2) the blend layer having a composition of EVOH and a polyolefin (not taught by Huffman et al.),
- (3) a specifically claimed classification of EVOH (having an ethylene content between 29 and 50 mole%)
- (4) a polyolefin selected from the group consisting of low-density polyethylene, polypropylene and linear low-density polyethylene,
- (5) a specific phase morphology of the blend layer, based upon the composition of the blend layer (wherein the blend layer includes a EVOH phase and a polyolefin phase, the EVOH phase being predominate), nor
- (6) when the blend layer is compounded without use of a compatibilizer, the blend takes on physical properties, which are beneficial in the discovered enhancement of the barrier properties of the blend, hence of a laminate within which the blend layer is incorporated.

On the foregoing basis alone, it is respectfully submitted that Huffman et al. fails as a primary "103(a)" reference with respect to Claims 19-23 and 26-35 of the present application. That is, it is respectfully submitted that a person of ordinary skill in the art at the time the presently claimed invention was made would not look to Huffman et al. as a "starting place" for developing a blend barrier layer comprising EVOH and a polyolefin inasmuch as Huffman et al. merely discloses that a laminate for packaging material may be formed from individual separate layers of various polymers and only after having been made cognizant of the usefulness of a blend layer by the present Applicant, is there found any suggestion or motivation for one skilled in the art relating to layering of polymers, that one should Huffman et al., as a "springboard" for developing a layered laminate for use as packaging material, such person would not have any hint of Applicant's specific blend nor of its phase morphology and the unexpected resultant optimization of the oxygen and moisture barrier properties of blend barrier layer.

More specifically, in Huffman et al., at column 2, lines 54, et seq., it is stated:

"In a preferred embodiment, of the present invention the laminate is prepared as follows:

Stepwise, the paperboard substrate is flame or corona treated on both surfaces. Second, a layer of LDPE is extrusion coated onto one surface of the paperboard at a temperature in excess of 600 degrees F. to achieve a good bond to the paperboard.

Thirdly, a layer of LDPE is extrusion coated onto the other surface of the paperboard at the same temperature as the first layer. And lastly, a five layer sandwich of EVOH surrounded by Plexar tie layers and LDPE covering layers is co extruded onto one of the first layers of LDPE applied to the paperboard at a temperature substantially less than 600 degrees F. to prevent degradation of the EVOH and tie layers.

The newly formed laminate is arranged so that the five layer construction becomes the inner surface of liquid contact surface of any containers made from the laminate and the laminate is scored, cut into blanks, folded and side seam heat-sealed in a conventional manner. (emphasis supplied).

Huffman et al. clearly teaches a multi-layered laminate where the resultant overall properties of the laminate are developed by an accumulation of the individual polymers, not by a blend of such polymers. Applicant discloses and claims a blend of EVOH and an olefin, which in and of itself is a layer, which has its own enhanced barrier properties. Hoffman et al. neither teach nor disclose nor suggest such.

Applicant was the first to disclose to the art that the claimed composition of EVOH and an olefin in a blended form and incorporated into a composite comprising the blend layer and, that such blend layer structure provides enhanced oxygen and moisture barrier protection of a nature that renders the paperboard suitable for formation of packaging designed to contain either dry or liquid products, including those liquid products where oxygen transfer into or out of the packaging is to be avoided. (See paragraph 0008 of Applicant's specification).

As disclosed by Applicant at paragraph 0001,

"More particularly, there is provided a laminate structure including a paper or paperboard substrate having at least one layer of EVOH/polyolefin composite containing an ethylene vinyl alcohol copolymer (44 mole% ethylene) and a polyolefin polymer resin. This EVOH/polyolefin composite layer is produced in the absence of a compatibilizer and can be directly attached to or coated on a paper or paperboard with linear low-density polyethylene tying layer. When the EVOH/polyolefin composite layer is produced in the absence of compatibilizers, interfacial regions result between the two phases with void areas. These void areas are large enough to allow small molecules such as oxygen or water to fill them.

The phrase "EVOH/polyolefin composite" refers to a blend of ethylene vinyl alcohol copolymer and a polyolefin. The EVOH polyolefin composite includes any variety EVOH or polyolefin in the preferred range of 35-95% EVOH. The materials can be melt or dry blended and are extrusion coated onto the paperboard or paper substrate without compatibilization. The composite creates a structure with discrete polyolefin domains dispersed in a continuous EVOH matrix. The resulting barrier structure has an oxygen transmission rate (OTR) at 75% relative humidity (RH) that is 0.75 times the OTR at 0% RH. The composite blends can be incorporated into structures used for packages containing milk, cereal, orange juice, or the like." (paragraph 0001).

As noted, the Examiner acknowledges that Huffman et al. provide no disclosure of a BLEND of EVOH and a polyolefin, nor "the exact composition of the EVOH". The precise applicability of the latter phrase "exact composition of the EVOH" is not understood. Huffman et al.

admittedly do not blend EVOH with some other polymer or other material, hence Huffman et al use 100% EVOH, which teaches one skilled in the art away from Huffman et al. when dealing with the issue of maximizing both the moisture and oxygen barrier properties of a laminate while simultaneously seeking to minimize the overall cost (EVOH is more expensive than most, if not all those polyolefins commonly used as individual layers in packaging laminates), to minimize the thickness, hence enhance the formability of the laminate into containers, etc. To the contrary, Huffman et al. teach that if added moisture barrier properties are needed for the laminate, one is to add additional layers of LDPE, thereby compounding the problems presented by Huffman et al., and certainly teaching away from Applicant's claimed invention.

It is thus respectfully requested that Huffman et al. be withdrawn as a primary reference in a rejection of Claims 19-23 and 26-35 under 35 USC § 103(a).

The Examiner cites Pearson et al. as disclosing a "barrier layer made from a blend of PE and EVOH that meets the blend requirements of claims 19 and 26(page 4, lines 16-30), the EVOH composition of claims 22 and 28 (page 11, lines 3-4), and the polyolefin of claims 23 and 29 (page 3, lines 21-25)." These references do not correlate with Applicant's copy of WO 96/10053. The locations within Pearson et al. where such teaching is found cannot be identified in Applicant's copy of WO/ 96/10053.

Nevertheless, it is noted that at page 2, line 25 of Pearson et al., it is stated:

"It is preferred that the olefin polymer(s) comprise from about 60 to about 90%, by wt. of the blend, and it is preferred that the

ethylene-vinyl-alcohol copolymer(s) comprise from about 10% to 40% by weight of the blend." (emphasis added).

And, again at page 4, line 16, Pearson et al, states:

"In the laminate articles of this invention, the ethylene-vinyl-alcohol copolymer, which provides the discontinuous phase, is typically present in amounts of from about 10% to about 40% by weight, preferably from about 15% to about 20% by weight, based on the total weight of olefin polymer and ethylene-vinyl-alcohol copolymer.... Laminar articles containing greater than about 40% by weight of ethylene-vinyl-alcohol copolymer are useful, but tend to be too costly for commercial purposes."

Pearson et al. disclose blends of EVOH and olefin(s) wherein the composite exhibits low modulus, a property useful when forming a laminate into a package. To achieve this goal, Pearson et al. propose combining EVOH with a polyolefin wherein the quantity of EVOH in the mix is minimized and the quantity of polyolefin in the mix is maximized. This concept sacrifices the oxygen barrier properties of the resulting laminate while enhancing the moisture barrier properties of the resulting laminate. This teaching of Pearson et al. is directly contrary to Applicant's claimed blend layer wherein the blend must contain not less than 35% and not more than 95%, by weight, EVOH, the polyolefin comprising the remainder of the combined EVOH/olefin blend.

Success of the Pearson et al. concept requires that the EVOH be in the form of "ribbons" or "bands" of EVOH domains (in a discontinuous phase) that are distributed within a continuous phase of polyofefin. This disclosure by Pearson et al. teaches directly away from Applicant's

invention wherein the EVOH is the continuous phase, or is co-continuous with the polyolefin phase. Should one skilled in the art seek to modify the teachings of Huffman et al. by incorporating into Huffman et al. a "blend" of EVOH and a polyolefin, the result would be a laminate comprising five layers, in which the barrier layer would have a low modulus, but which would exhibit unacceptably low oxygen barrier property and maximum moisture barrier property. Such a modification of Huffman et al. per the disclosure and teaching of Pearson et al. would run fully contrary to Applicant's claimed composite in which the barrier layer simultaneously optimizes both oxygen and moisture barrier properties.

Further, Pearson et al. teach (p.2 –Summary) that the melting point of the EVOH is to be at least 5 degrees below the melting point of the polyolefin, this being necessary for accomplishing the distribution of the EVOH domains throughout the molten polyolefin in the process of forming the "barrier" layer of Pearson et al. This process factor further teaches away from Applicant's claimed composite having a true blend layer made from EVOH and polyolefin wherein the EVOH is the continuous phase or is co-continuous in phase with the olefin phase, the distinction here being the ability of Applicant's claimed blend layer to optimize the desired barrier properties of both the EVOH and the polyolefin. As set forth in Applicant's examples, the selected EVOH has a softening point approximately 70% higher than the melting point of the chosen polyolefin (low density polyethylene, for example) (EVOH – 164° C vs. LDPE 95° C). This vast difference in melting points of the two components of the mix of Pearson et al. and the blend of Applicant is respectfully submitted to result in Pearson et al. teaching away from Applicant's claimed Invention.

In view of the failure of Pearson et al to disclose or teach or suggest Applicant's claimed blend of EVOH and polyolefin, including (1) Applicant's claimed range of concentration of EVOH outside the range of EVOH

disclosed or taught by Pearson et al.; and (2) Applicant's optimization of the oxygen and moisture barrier properties of the blend layer, hence of the laminate formed using the blend layer, among other things, it is respectfully suggested that the rejection of Claim 19 under 35 USC § 103(a) as unpatentable over Huffman et al., in view of Pearson et al., be withdrawn.

The Examiner contends that "about 40%" as stated as the upper limit of Pearson et al. is "overlapping" with the lower limit of "about 45%" as previously claimed by Applicant. The basis for this contention appears to be merely that there is overlapping of the ranges, hence it would be obvious to use the Pearson et al. range in a mix of EVOH and PE in the Huffman et al. layered laminate. It is respectfully submitted that this general statement, however, carries no weight in the present instance.

Specifically, applicant's Claim 19, as presently presented for examination, calls for at not less than 35% and not greater than 95% EVOH. Whereas it is recognized that Applicant's range of EVOH concentration in the claimed blend (35% - 95%, by weight) overlaps the range of EVOH disclosed by Pearson et al. (10 to 40%, by weight), it is of importance to note that this overlap is only over a range of 5%, by weight, AND this overlap is clearly limited to only the minimum quantity of EVOH claimed by Applicant and the maximum quantity of EVOH useful in the Pearson et al. mix, thereby rendering this relatively small degree of overlap immaterial with respect to the Examiner's contention that the mere fact of some degree of overlapping of ranges of concentration makes it obvious to one skilled in the art to look to Pearson et al. to adopt Applicant's entire range of EVOH content in a blend barrier layer useful in a packaging material laminate. More specifically, Pearson et al. teaches that exceeding their upper limit 40% EVOH is not acceptable, in part because to do so would destroy the phase morphology of the layer in that to exceed the upper limit of EVOH as taught by Pearson et al. would change the EVOH phase away

from the EVOH being the discontinuous phase as is required in Pearson et al. Completely to the contrary, Applicant claims a range of EVOH having a minimum limit past which the EVOH no longer is the desired continuous phase. (Pearson et al, p.4, lines 16 et seq.)

Irrespective, Applicant has amended Claim 19 to specifically recite that the range eliminates EVOH in the blend by an amount, by weight, of less than 35% and not more than 95%. Amended Claim 19 thus is returned to its original language, support for which is found in the specification (paragraph 0001 for example) and Examples presented by Applicant. It is respectfully suggested that the Examiner may be confusing the percentages of EVOH with the percentages of polyolefin when she states that Pearson et al. "meets the blend requirements of claims 19 and 26 (page 4, lines 16-30), the EVOH composition of claims 22 and 28 (page 11, lines 3-4), and the polyolefin of claims 23 and 29 (page 3, lines 21-25)." For instance, comparing Pearson et al.'s range of PE (60 to 90%, by weight) with Applicant's range of EVOH (35 to 95%, by weight, it does appear that there might be significant overlapping of ranges. Such is not the case as has been discussed herein.

Moreover, it is entirely unexpected from the disclosure of Pearson et al. that if one attempted to employ Applicant's claimed range of EVOH concentration in an EVOH/olefin mix there would occur optimization of the oxygen barrier and the moisture barrier properties of the mix. Basically, Pearson et al. and Applicant follow opposing directions. Pearson et al. teach low modulus for their laminate and achieve such at the expense of lower oxygen barrier properties. Applicant claims a blend having optimized oxygen and moisture barrier properties, AND through the use of the blend have discovered that thinner layers, hence thinner overall laminate thicknesses are possible.

With respect to the Examiner's contention that "At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the blend barrier layer in Pearson et al. in the multilayer laminate in Huffman et al.", it is noted that Applicant discloses that EVOH/olefin blends which have less than 35% EVOH, by weight, lose an unacceptable portion of their oxygen barrier properties, hence are undesirable in blends such as those disclosed by Pearson et al. It is within the range of below 35% EVOH in the blend that olefin domains predominate, resulting in the loss of oxygen barrier properties for the blend. As claimed by Applicant, it is only within the EVOH range of about 35%-95%, by weight, that the blend exhibits optimumization of the desired moisture and oxygen barrier properties of the blend layer. This factor also refutes the Examiner's contention that blends of EVOH/olefins having 10% to 40% EVOH as taught by Pearson et al. would have OTR values the same as Applicant's claimed blends which contain not less than 35% and not more than about 95% EVOH. Applicant's tests of their blends show that the barrier properties of the blend correlate with the morphology of the blend. As disclosed at paragraph 1043 of Applicant's specification, "Scanning electron microscopy has shown the blends to be composed of two incompatible phases with the discreet component contained in rod or plank like domains in the continuous phase. For compositions with less than about 45% EVOH, LDPE is the continuous phase. For compositions with greater than about 45% EVOH, EVOH is the continuous component. For compositions containing 40-50% EVOH, the phase morphology is co-continuous, containing localized regions of both EVOH and LDPE continuous phases, by weight, in the claimed blend. The barrier values of the film were close to that of LDPE for the LDPE continuous blends, and close to those of EVOH (within an order of magnitude) for the EVOH continuous blends."

It is thus respectfully submitted that the combination of Pearson et al, with Huffman et al, fails to either disclose, teach or suggest Applicant's invention as set forth in Claim 19.

Withdrawal of the rejection of Claim 19 under 35 USC 103(a) over Huffman et al, in view of Pearson et al. is respectfully requested.

Claims 21-23 have been cancelled.

Claims 25- 30 have been cancelled.

Claims 32 – 35 have been cancelled.

Claims 20 and 24 are either directly or indirectly dependent on Claim 19 and as such they inherit each and every element of their parent claim and any intervening claims. Therefore, allow ability of Claims 20-22 is urged for the same reasons, among others, as set forth hereinabove in discussing the allow ability of Claim 19.

Claim 24 also stands rejected under 35 USC 103(a) as being unpatentable over Huffman et al. In view of Pearson et al. "as applied to Claims 19-23 and 26-29" and further in view of either Bradfute et al. or Rosenbaum et al.

Claim 24 is indirectly dependent on Claim 19 and as such inherits each and every element of its parent claim and any intervening claims. Therefore, allow ability of Claim 24 is urged for the same reasons, among others, as set forth hereinabove in discussing the allow ability of Claim 19.

Withdrawal of the rejection of Claim 24 under 35 USC 103(a) over Huffman et al, in view of Pearson et al. and further in view of Bradfute et al, or Rosenbaum et al. is respectfully requested.

Claim 30 has been cancelled.

Claims 19-22 and 26-28 stand rejected under 35 USC §103(a) as being unpatentable over Huffman et al. in view of the combined teachings of Svensson (EP 423511A1) and Harita et al.

The Examiner refers to earlier office actions discussing Huffman et al. Concerning Huffman et al., attention is invited to the discussions hereinabove relating to the inapplicability of Huffman et al. under 35 USC 103(a).

In addition to the Examiner's noting that Huffman et al.

(1) "does not specify the exact composition of the EVOH",

(2) nor that the barrier layer is a blend of EVOH and an olefin polymer,

(3)"nor does it explicitly disclose the presence of a tie layer between the substrate and the multilayer structure.

it is noted that Huffman et al. also

(4) does not disclose Applicant's claimed range of EVOH for a blend layer, nor the accompanying range of the polyolefin in the blend,

(5) does not disclose a range of ethylene content of the EVOH in a blend layer,

(6) nor the use of low-density polyolefin, propylene or linear low-density polyethylene as acceptably polyolefins for a blend layer for a laminate packaging material.

Svensson is cited by the Examiner as teaching

(1) a "blend of PE and EVOH" which "provides a useful barrier layer for food packaging",

(2) the ratio of EVOH and PE in the blend" meeting "the restrictions of claims 19 and 26" and

(3) "the use of an additional tie layer between the substrate and the blend barrier layer".

As further noted by the Examiner, Svensson does not mention the ethylene content of the EVOH copolymer in the blend layer.

Further, it is noted that Svensson

(4) does not disclose that the polyolefin of the blend layer is to be either low density polyethylene, polypropylene or liner low density polyethylene,

(5) does not disclose optimization of the oxygen and moisture barrier properties of the blend layer through the mechanism of choosing the EVOH phase of the blend as the continuous phase with the olefin domains disbursed with the EVOH phase, a phenomenon which Applicant has

discovered to occur within the exclusive range of 35% to 95% EVOH and wherein the ethylene content of the EVOH is between 29 and 50 mole%, of the EVOH/olefin blend layer,

Whereas it is noted that Svensson discloses a blend layer for use in a packaging laminate as a barrier layer wherein the EVOH is present in an amount of between 10% and 40% by weight, this is only the beginning of the story. At page 2, line 8 et seq., Pearson et al state that "This invention provides a laminar article comprising a blend of at least one olefin polymer and at least one ethylene alcohol copolymer." At page 3, line 16 et seq., Pearson et al. further state "The term 'laminar' means that the dispersed components of the blend (i.e. discontinuous phase) is present within the dispersive component of the blend (i.e., continuous phase) as multiple, thin, substantially parallel, overlapping layers. The term "compatabilizer" means a polymer that serves to adhere adjacent layers of olefin polymers and ethylene vinyl alcohol to one another." (emphasis supplied). Specifically, Applicant has discovered, most unexpectedly, that merely combining EVOH and a polyolefin will not produce a blend layer, which enjoys optimized oxygen and moisture barrier properties. This phenomenon, as found by Applicant is made possible when one adjusts the phase morphology of the blend. Such adjustment of the phase morphology is found in the choice of the EVOH (29 to 50 mole % ethylene content, and 35 – 95%, by weight of EVOH in the blend), and choice of the olefin employed in the blend (low density polyethylene, polypropylene or liner low density polyethylene), among other things.

Whereas the Examiner cites Charrier as teaching that PE incorporates all polyethylenes, it is respectfully submitted that the practice of using PE is a "shorthand" used in the industry when there is no specific requirement for designating which one or ones of the polyethylene classifications is intended.

More specifically, it is well known in the industry that polyethylenes are well classified and each class exhibits its own unique physical and chemical properties. As is also well recognized, polyethylene is a string of ethene molecules, at times reaching into the millions of molecules joined in end-to-end fashion in a straight string. Polyethylene is created through polymerization of ethane. It can be produced through radical polymerization, anionic polymerization and cationic polymerization. This is because ethane does not have any substitute groups, which influence the stability of the propagation head of the polymer. Each of these methods results in different classifications of polyethylene.

Polyethylene is classified into several different categories based mostly on its density and branching. Unbranched polyethylene is referred to properly as "linear polyethylene". The mechanical properties of the different classifications of PE depend significantly on variables such as the extent and type of branching, the crystal structure and the molecular weight. These categories include:

UHMWPE (ultra high molecular weight PE)

HDPE (high density PE)

HDXLPE (high density cross-linked PE)

PEX (cross-linked PE)

MDPE (medium density PE)

LDPE (low density PE)

LLDPE (linear low density PE)

VLDPE (very low density PE)

Of specific pertinence in the present application are:

PE

LDPE

LLDPE

As noted above, PE comprises a straight chain of ethane molecules.

LDPE is defined by a density range of 0.910 – 0.940 g/cc. LDPE has a high degree of short and long chain branching, which means that the chains do not pack into the crystal structure as well. It has therefore less strong intermolecular forces, as the instantaneous-dipole induced-dipole attraction is less. This results in a lower tensile strength and increased ductility. LDPE is created by free radical polymerization. The high degree of branches with long chains gives molten LDPE unique and desirable flow properties. In the present invention, these properties of LDPE provide good blending and good coextrusion properties as well as providing for the good distribution of the LDPE domains in a continuous phase EVOH.

LLDPE is defined by a density range of 0.915 -0.925 gm/cc, less than the density of LDPE. LLDPE is a substantially linear polymer with significant numbers of short branches, commonly made by copolymerization of ethylene with short-chain alfa-olefins. LLDPE exhibits substantially the same mechanical properties as LDPE. As discovered by Applicant, polypropylene performs suitably as the polyolefin component of Applicant's claimed blend layer, providing substantially the same OTR for the blend layer as does LLDE and LLDPE.

Applicant teaches (paragraph 0041) that one example of a suitable LDPE is that sold by Eastman as 1924P (also under the brand name VORIDIAN. This product, when incorporated into an EVOH/olefin blend,

exhibits excellent ease of processing, good chill-roll release, low coefficient of friction and good heat seal ability. It is further characterized by high-speed process ability, excellent drawdown and reliable lot-to-lot consistency. Its "softening temperature" is 95° C making it compatible with EVOH for developing the desired phase morphology taught by Applicant as being obtained through a blend of EVOH (29 – 50 mole % ethylene and 35% – 95%, by weight EVOH in the blend).

However, Svensson teaches an EVOH and PE blend wherein the PE is present in an amount of between 20% and 80%, by weight. Whereas this range of polyolefin overlaps with the range claimed by Applicant, it is of importance to note that Svensson employs PE, not LDPE nor LLDPE, nor POLYPROPYLENE. This factor is of major relevance in that as found by Applicant, only within Applicant's claimed limited range of LDPE (5% - 55%, by weight), COMBINED WITH the limited range of EVOH (35% - 95%, by weight, and of between 29 and 50 mole % ethylene) can one obtain the desired optimization of the oxygen and moisture barrier properties of the blend layer. This feature of Applicant's invention is critical to the success of the resulting laminate in that, as found by Applicant, EVOH outside the claimed limits loses its oxygen barrier properties when present in the blend in a quantity less than 35%, by weight, by reason of the change in phase morphology of the blend. At EVOH content above 95%, the quantity of EVOH in the blend approaches 100% EVOH and provides no material benefit, but rather increases the cost of the blend layer. It is therefore respectfully submitted that

(1) Svensson teaches only the use of PE (which is shown above to not include LDPE nor LLDPE, and certainly not PP). This factor is evident from the fact that Svensson teaches that the use of up to 80%, by weight, PE in the EVOH/PE blend, a fact that has been shown by Applicant to render the blend unsuitable as an oxygen barrier. Further, as the Examiner notes, Svensson mentions only PE and further teaches that the PE is the

continuous phase, which as found by Applicant, renders the blend inadequate as an oxygen barrier in the blend.

It is therefore respectfully submitted that Applicant has discovered an unexpected result obtainable only through the very specific limitations set forth in Claim 19 for the components of the blend. Not only does Svensson disclose only PE as the olefin in a blend of EVOH and an olefin, if one skilled in the art attempted to modify Huffman et al. by incorporating the blend taught by Svensson into the Huffman et al. laminate, the result would not produce a laminate having a blend layer which optimizes both the oxygen and the moisture barrier properties of the blend layer, hence enhancement of the oxygen and moisture barrier properties of the resulting laminate. Still further, one skilled in the art would encounter unnecessary experimentation if such person attempted to combine the blend of Svensson with the Huffman et al. laminate in that such person would first be required to experiment to determine which PE to use, then further experiment to determine a successful combination of EVOH and the selected PE which would produce the result which only Applicant has discovered and which is not taught in any of the known prior art.

Harita et al. is cited as teaching that EVOH having the applicant's claimed amount of ethylene (claims 22 and 28) is commonly used in food packaging applications because of its barrier properties. Claims 22 and 28 have been cancelled so that the aforesaid application of Harita et al. is moot and its withdrawal is respectfully requested.

Claims 21,22, 27 and 28 have been cancelled.

Claims 20, 24 and 26 are either directly or indirectly dependent on Claim 19 and as such they inherit each and every element of their parent claim and any intervening claims. Therefore, allow ability of Claims 20, 24

and 27 is urged for the same reasons, among others, as set forth hereinabove in discussing the allow ability of Claim 19.

Withdrawal of the rejection of Claims 19,20,24 and 26 as being unpatentable over Huffman et al. in view of Svennson and Harita et al. is respectfully requested.

The Examiner further notes that "the blend layers containing the suggested 50% EVOH would possess the applicant's claimed OTR values" by reason of "the fact that the references teach the same amounts of EVOH and the same ethylene content of the EVOH". Contariwise, in Applicant's claims invention, the OTR is not determined by the quantity of EVOH in the blend. Rather, the OTR of the blend layer is determined by the morphology of the blend, and the morphology of the blend is a function of the relative presence of EVOH and the selected olefin and the absence of compatibilizers. As taught by Applicant in paragraph 0001, "When the EVOH/polyolefin composite layer is produced in the absence of compatibilizers, interfacial regions result between the two phases with void areas. These void areas are large enough for small molecules such as oxygen or water to fill them." This factor of filling these voids either slows or completely halts further transfer of oxygen and moisture through the blend layer.

Claims 23, 25, 29 and 31 stand rejected under 35 USC §103(a) as being unpatentable over Huffman et al. In view of the combined teachings of Svennson and Harita et al, applied to Claims 19-22 and 26-28 above, and further in view of Charrier.

Claims 23 and 29 have been cancelled.

Claims 25 and 31 are dependent either directly or indirectly on Claim 19, the allow ability of which has been discussed here above. Thus Claims 25 and 31 inherit each and every one of the limitations of their parent claim and any intervening claims. Accordingly, allowance of Claims 25 and 31 is urged for the same reason, among others, as set forth herein above in discussing the allow ability of Claim 19.

Claims 24 and 30 stand rejected under 35 USC §103(a) as being unpatentable over Huffman et al. In view of the combined teaching of Svennsson and Harita et al as applied to claims 19 and 26 and further in view of either Bradfute et al. or Rosenbaum et al.

Claim 30 has been cancelled.

Claim 24 is indirectly dependent on Claim 19 and as such inherits each and every element of its parent claim and any intervening claims. Therefore, allow ability of Claim 24 is urged for the same reasons, among others, as set forth hereinabove in discussing the allow ability of Claim 19.

Claims 19-31 and 35 stand rejected under 35 USC §112, first paragraph, as failing to comply with the written description requirement. The claim(s) are stated by the Examiner to contain subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventor(s), at the time the application was filed, has possession of the claimed invention.

Specifically, the Examiner notes that the claims "recited that the blend layer has an oxygen transmission rate (OTR) of less than about 1 cc*mil/100in² *day. However, the specification does not support such a range. Whereas Applicant respectfully submits that the recited range of OTR of the blend is supported by Applicant's specification, the recitation of

the OTR of the blend is not deemed critical to the allow ability of the presently presented Claims. In view of the deletion of this factor from the Claims, this issue is deemed moot.

Further, the Examiner notes that the range of EVOH in the blend layer has been changed to "about 45% to about 95%. This range of EVOH in Applicant's blend barrier layer has been reestablished as present in earlier version(s) of Claim 19. This issue is now deemed moot. The issue of overlapping of the ranges of EVOH disclosed by Applicant and Pearson et al. is discussed hereinabove. It is respectfully submitted that the issue of obviousness based on "overlapping" of the ranges Claim has been shown to not be applicable in the present situation. In this respect, it is noted that Claim 19 as amended defines the ranges of EVOH and of the selected polyolefin OF THE BLEND, not the laminate itself. In Claim 19, there is claimed a laminate COMPRISING the defined blend barrier layer. It is this barrier layer, which is critical to Applicant's invention, and it is to recognized that such blend barrier layer is just one layer. It may be included along with any of a large variety of other layers to define a laminate as noted in Applicant's specification.

With respect to the Examiner's "Response to Argument" beginning with paragraph 19 of the Office Action in question,

19. The OTR range issue is now moot.

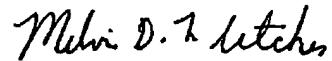
20. The issue of overlapping ranges of EVOH has been addressed hereinabove.

21, 22 and 23. The issue of the disclosure and teaching of Svennson has been discussed hereinabove.

New Claims 36-42 are each dependent from Claim 19. Their allowance is urged for the same reasons as set forth herein in discussing the allow ability of Claim 19.

Reconsideration of the application and allowance of Claims 19, 20, 24-26 and 31 are respectfully requested.

Respectfully submitted



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